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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/077,029	05/18/1998	MUTSUMI KIMURA	JAO40499	5555
25944 7590 01/23/2008 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850			EXAMINER LIN, JAMES	
			ART UNIT 1792	PAPER NUMBER
			MAIL DATE 01/23/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.		Applicant(s)	
	09/077,029		KIMURA ET AL.	
	Examiner		Art Unit	
	Jimmy Lin		1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 101-105, 107-112, 116-120 and 123 is/are pending in the application.
- 4a) Of the above claim(s) 116-120 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 101-105, 107-112 and 123 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/21/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The substitute specification filed 6/14/2007 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because: the wording of “lyophilicity” in the original specification filed 5/18/1998 has been changed to “wettability”. There is no indication in the original specification as filed that the Applicant had intended to define “lyophilicity” as or to have the same meaning as “wettability”. According to dictionary.com, the two words have very different definitions and, thus, they cannot be used interchangeably. The Applicant is advised to find and submit a definition from a reliable source that lyophilicity can have a definition that is useable with the claim language. This definition can then be used as the interpretation of lyophilicity.

Claim Objections

2. Claims 105, 107, and 110 are objected to because of the following informalities:

The recitations of “the first electrode” and “the predetermined position” (claim 105, line 13) should be amended to “the plurality of the first electrodes” and “the predetermined positions”, respectively.

The recitation of “the first electrode” (claim 107) should be amended to “the plurality of the first electrodes”.

The recitation of “a predetermined position of a substrate” (claim 110, lines 6-7) should be amended to “predetermined positions of a substrate”.

Appropriate correction is required.

Claim Interpretations

3. The term “surround” has been given its ordinary meaning, which is to form an enclosure round or to encircle.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 105 and 107-115 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no support for changing the term "lyophilicity" to "wettability" (claims 105, 107-115) because the terms have different definitions. The specification as originally filed does not define lyophilicity to have the same meaning as wettability. Thus, amending the claims as such would change the scope of the claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 101-104 and 123 are rejected under 35 U.S.C. 103(a) as being obvious over Roitman (U.S. Patent 5,972,419) in view of Ra et al. (U.S. Patent No. 5,874,200).

Roitman discloses a method of making an EL device (abstract). Pixel electrode 132 is formed on a substrate and a solid insulating layer 131 is formed on the electrode. EL material is deposited in the wells formed between the insulating layers (col. 3, lines 29-50). The insulating layer can be left in place (col. 4, lines 1-2). The purpose of the insulating layer is to confine the droplets of EL material, preventing them from mixing.

Roitman does not explicitly teach enhancing a liquid repellency at a surface of the insulating layer. However, Roitman does teach in a first embodiment that insulation layers can be formed on the substrate to confine the droplets, and in a second embodiment that hydrophilic and hydrophobic regions can be formed on the substrate in order to confine the droplets. Using

both embodiments together would have further ensured the confinement of the droplets and, thus, would have been an obvious modification. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used insulating layers while at the same time forming hydrophilic and hydrophobic regions on the substrate of Roitman with a reasonable expectation of success. One would have been motivated to do so in order to have further ensured the confinement of the droplets. In light of these teachings, one of ordinary skill in the art would have made the first electrode more wettable towards the liquid droplets while making the insulating layers more repellent.

Roitman does not explicitly teach that enhancing a liquid repellency at the surface of the insulating layer is performed by one of an ultraviolet (UV) irradiation and an irradiation of plasma. Roitman does teach that the insulating layer 131 can be a conventional photoresist material. Accordingly, Ra teaches a method of reducing the hydrophobicity of a photoresist such that the photoresist comes to have more hydrophilicity. The method comprises of exposing the photoresist to UV irradiation (col. 3, line 57-col. 4, line 17). Roitman exemplifies xylene as a suitable solvent (col. 3, lines 1-10). Xylene is a hydrophobic liquid and would be at least somewhat repellent to a hydrophilic surface. Because the combination of using insulating layers as well as forming hydrophobic and hydrophilic regions would have been obvious over the teachings of Roitman, it would have been obvious to one of ordinary skill in the art at the time of invention to have exposed the insulating layers of Roitman to UV irradiation in order to have made the insulating layers more hydrophilic towards xylene with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Roitman does not explicitly teach the order of patterning the insulating layer and enhancing the liquid repellency of the insulating layer. However, one of ordinary skill in the art would have expected similar results in performing the patterning of the insulating before or after enhancing the liquid repellency because either method would have enhanced the upper surface of the insulating layer. The selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. See, for instance, *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). Therefore, it would have been obvious to one of ordinary skill

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in the art at the time of invention to have performed the patterning step *after* the enhancing step, as opposed to performing the patterning step *prior to* the enhancing step, with a reasonable expectation of success because one of ordinary skill would not have anticipated any new or unexpected results and, thus, would have done so with predictable results.

Claim 123: Roitman does not explicitly teach that the repellency of the side-wall of the insulating layer is lower than the liquid repellency of the upper surface of the insulating layer. However, this phenomenon occurs when the UV liquid repellency enhancement step of Ra is performed before the patterning step. Because only the top surface of the insulating layer is exposed to the UV irradiation when irradiation occurs prior to patterning, the repellency of the side-walls of the insulating layer has not been enhanced. Thus, performing the UV irradiation prior to patterning would necessarily form side-walls having less repellency than the upper surfaces.

8. Claims 105 and 107-111 are rejected under 35 U.S.C. 103(a) as being obvious over Roitman '419 in view of Kaneko (JP 07-153574, as provided by Applicant) and Ohno et al. (U.S. Patent No. 5,705,302).

Roitman is discussed above, but does not explicitly teach a plurality of first electrodes on predetermined positions and forming an insulating layer so as to surround the predetermined positions. However, Kaneko teaches that it was well known in the art of EL devices to have formed pixels 14 in rectangular shapes. Insulating layers 13 are used to form the pixels. In this configuration, the insulating layers surround a plurality of electrodes 12 (Figs. 1, 3, and 5-8). Because Roitman teaches that insulating layers are used to define pixels and because Kaneko teaches that such insulating layer configurations were operable in the EL art, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed an insulating layer so as to surround a plurality of electrodes to define rectangular pixels in the EL device of Roitman with a reasonable expectation of success.

Roitman does not explicitly teach a difference of wettability between the first electrode and the insulating layer. However, Roitman teaches in a first embodiment that insulation layers can be formed on the substrate to confine the droplets, and teaches in a second embodiment that hydrophilic and hydrophobic regions can be formed on the substrate in order to confine the

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droplets. Using both embodiments together would have further ensured the confinement of the droplets and, thus, would have been an obvious modification. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used insulating layers while at the same time forming hydrophilic and hydrophobic regions on the substrate of Roitman with a reasonable expectation of success. One would have been motivated to do so in order to have further ensured the confinement of the droplets. In light of these teachings, one of ordinary skill in the art would have made the first electrode more wettable towards the liquid droplets while making the insulating layers more repellent.

Roitman does not explicitly teach that the wettability of the first electrode is enhanced. However, Ohno teaches that conductive layers such as those made of indium tin oxide (ITO) can be made hydrophobic with treatments such as RF plasma and UV light irradiation (col. 9, lines 13-25). The enhanced hydrophobicity of the ITO film would be more wettable towards the hydrophobic xylene solvent of Roitman. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have enhanced the hydrophobicity of the first electrode of Roitman (Roitman exemplifies ITO as a suitable first electrode material, see col. 2, lines 40-42) with a reasonable expectation of success because Roitman made the suggestion of having hydrophobic and hydrophilic regions in order to confine the droplets and because Ohno teaches that ITO films can be treated to enhance hydrophobicity. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Claim 107: Kaneko teaches that the insulating layer covers at least part of the first electrodes (Fig. 3).

Claim 108: Roitman does not explicitly teach that forming an interlayer film on the insulating layer, wherein the interlayer film is repellent to the liquid solution compared to the first electrode. However, any method of making the region of the insulating layer to be hydrophilic would have been operable. Forming a hydrophilic film onto the insulating layer would have been an operable method and would have been well within the knowledge of one of ordinary skill. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed a hydrophilic film onto the insulating layer of Roitman in light

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of the teachings of Roitman with a reasonable expectation of success. One would have been motivated to do so to have made a hydrophilic region.

Claim 109: Roitman teaches that the liquid solution is deposited by an ink jet method.

Claim 111: In light of the teachings of Roitman, one of ordinary skill in the art would have made the insulating layer hydrophilic while enhancing the hydrophobicity of the first electrode according to the method of Ohno. Thus, the insulating layer would be more repellent to the liquid solution compared to the electrode.

9. Claim 112 is rejected under 35 U.S.C. 103(a) as being obvious over Roitman '419 in view of Kaneko '574 and Ohno '302 as discussed above for claim 110, and further in view of Ra '200.

Roitman is discussed above, but does not explicitly teach that the repellency of the side-wall of the insulating layer is lower than that of the upper surface of the insulating layer. However, such is obvious for substantially the same reasons as discussed in claim 123.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 101-104 and 123 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 and 7 of U.S. Patent No. 6,755,983 in view of Roitman '419. The claims of '983 do not require that the method is to manufacture an electroluminescent device or that pixel electrodes are formed. However, Roitman teaches that the formation and treatment of the insulating layers (i.e., the banks as claimed in '983) can be applied to an electroluminescent display. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have applied the invention of '983 to an electroluminescent device because Roitman teaches that such methods of confining the deposition solution are advantageous in the application of electroluminescent devices.

'983 does not require a specific order of performing the patterning and the enhancing steps. However, one of ordinary skill in the art would have expected similar results in performing the patterning of the insulating before or after enhancing the liquid repellency. The selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. See, for instance, *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have performed the patterning step prior to the enhancing step or to have performed the patterning step after the enhancing step with an expectation of similar results and with a reasonable expectation of success because one of ordinary skill would not have anticipated any new or unexpected results.

12. Claims 105, 107, and 108-112 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 and 7 of U.S. Patent No. 6,755,983 in view of Roitman '419, Kaneko '574, Ohno '302, and Ra '200 for substantially the same reasons as discussed in the 35 U.S.C. 103(a) rejections above.

Response to Arguments

13. Applicant's arguments, see pg. 8-9, filed 10/30/2007, with respect to the rejection(s) of claim(s) 1-4 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore,

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the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Roitman '419 and Ra '200.

14: Applicant's arguments filed 10/30/2007 have been fully considered but they are not persuasive.

Objection to the specification:

Applicant argues on pg. 7 that the term "lyophilic" is an error in translation and that the description on pg. 3-4 and pg. 25 of the specification corresponds to the term "wettability". However, the term "lyophilicity" as used on pg. 25 does not necessarily mean wettability because, assuming *arguendo* that the term has been mistranslated, it can also mean "the likelihood of a liquid to stay", which is not equivalent to wettability. The best approach to clarifying such an error in translation, assuming all other priority conditions have been met, is to have a certified translator re-translated the original priority document

Claims 101-104:

Applicant argues on pg. 9 that the present specification discloses that there are new and unexpected results by patterning and exposing in the claimed order. Applicant further argues that when the enhancing of the liquid repellency is carried out *before* patterning, the inner wall has a low liquid repellency so that the liquid material stays in the region surrounded by the difference in height 111. However, the present specification also teaches that when the enhancing is carried out *after* patterning, it is possible to use vertical irradiation of ultraviolet rays in order to prevent an increase in the liquid repellency of the inner wall (paragraph bridging pg. 65-67). Thus, one of ordinary skill in the art would have expected both order of steps to have achieved similar results and would have used one method over the other with a reasonable expectation of success.

Applicant argues on pg. 10 argues that the method recited in claim 101 results in a stronger liquid repellency at the surface of the insulating layer because the insulating layer is not exposed to resists or developing solutions that are used in the process for patterning the solid insulating layer. However, the order of steps does not affect whether or not the insulating layer is exposed to resists or developing solutions. The resists and developing solutions are used to

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pattern the insulating layer and would be used regardless whether the patterning is performed before or after the exposure. The specification does teach that there is advantage of eliminating the possibility that the liquid repellency deteriorates in the etching step if the UV irradiation is performed *after* the etching step (paragraph bridging pg. 65-66). This advantage does not apply to claim 101 because the claim requires UV irradiation *before* the patterning step. Nevertheless, one of ordinary skill in the art would have expected either order of steps to have been operable equivalents because substitution of one method for the other would have yielded predictable results.

Claim 123:

Applicant argues on pg. 11 that the Office Action provides no reason as to why one of ordinary skill in the art would have been motivated Roitman to result in the features of claim 123. However, the modification to the order of steps of Roitman was discussed in claims 101-104, and such a modification would necessarily result in the liquid repellency of the side-wall being lower than the liquid repellency of the upper surface (i.e., the claimed features of claim 123) because only the top surface of the insulating layer is exposed to the UV irradiation when irradiation occurs prior to patterning. With such order of steps, the repellency of the side-walls of the insulating layer has not been enhanced, thus rendering the liquid repellency at the upper surface to be greater than that of the side-walls.

Claims 105, 107, and 108-112:

Applicant argues on pg. 12 that Roitman, Ohno, and Hasegawa fail to teach a plurality of first electrodes or a plurality of organic semiconductor films. However, Kaneko teaches that such modifications to Roitman would have been obvious. See above discussion.

Applicant argues on pg. 12-13 that the plain meaning of the term "surround" means to enclose or confine on all sides so as to bar escape or outside communication. However, this particular definition seems to be in the context of people, as in barring escape or outside communication of people. The definition "to form an enclosure round; encircle" is more consistent with the context of the claims. In this case, Roitman's insulating layer does not surround a predetermined position because the insulating layers are formed on only two sides of

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the position and, thus, does not encircle the position. Accordingly, Kaneko has been added to the grounds of rejection to teach the surrounding of a predetermined position. The insulating layer of Kaneko surrounds the position because the insulating layer is formed on all four sides of the position.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is 571-272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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